

# PATENT ABSTRACTS OF JAPAN

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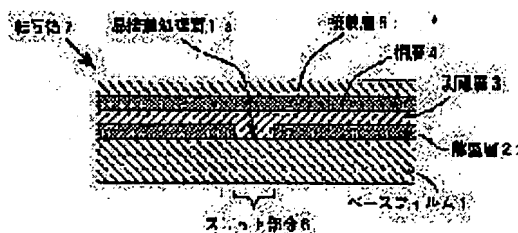
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## (54) TRANSFER FOIL INHIBITED TO BE CHIPPED

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide a transfer foil inhibited to be chipped in the case of slitting the foil to become a suitable width for transferring.

**SOLUTION:** In the transfer foil 7, one side surface of a base film 1 is treated to be easily adhered, and a release layer 2 is provided on the easily adhered surface 1a except a slit part 6. A surface of the film 1 at the side provided with the layer 2 is entirely provided with a release layer 3 which is released from the layer 2 but not released from the film 1. And, a pattern layer 4 and an adhesive layer 5 are sequentially laminated on the layer 3.



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CLAIMS

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[Claim(s)]

[Claim 1] It is the imprint foil which is characterized by preparing extensively the stratum disjunctum not exfoliating from a base film in the near field in which easily-adhesive processing is performed to one side of a base film, the mold release layer is prepared except for the slit part on the easily-adhesive processing side, and the mold release layer of a base film was prepared although it exfoliates from a mold release layer, and carrying out the laminating of a pattern layer and the adhesives layer one by one on stratum disjunctum and which does not \*\*\*\*\*.

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

[0001]

[The field of the technique in which invention belongs] This invention relates to the imprint foil which does not \*\*\*\*\* in case a slit is carried out so that it may become the suitable width of face for an imprint.

[0002]

[Description of the Prior Art] Conventionally, the laminating of the mold release layer 2 and the stratum disjunctum 3 is extensively carried out one by one on one side of a base film 1. The imprint foil 7 (refer to drawing 4 ) with which the laminating of a pattern layer 4, the adhesives layer 5, etc. is carried out one by one on stratum disjunctum 3 is used. After sticking the imprint layer which carries out heating application of pressure and consists of stratum disjunctum 3, a pattern layer 4, an adhesives layer 5, etc. in a transferred object, a base film 1 is exfoliated the whole mold release layer 2, and there is a replica method which ornaments by transferring only an imprint layer to a transferred object front face. Moreover, when transferred objects are resin mold goods, after making putting the imprint foil 7 in shaping metal mold as an approach of performing a replica method more rationally, carrying out injection fullness of the resin into a cavity, cooling, and obtaining resin mold goods, and coincidence paste up the imprint foil 7 on the field, a base film 1 is exfoliated the whole mold release layer 2, and there is a shaping simultaneous replica method which ornaments by transferring an imprint layer to a resin mold-goods front face.

[0003] Usually, imprinting is performed, after producing commercially by double width, doubling this with the magnitude of the transferred object 8 and carrying out a slit (refer to drawing 5 ) to suitable width of face, since it is uneconomical if the imprint foil 7 used for a replica method or a shaping simultaneous replica method is manufactured by the width of face doubled with the magnitude of the transferred object 8 at the time of imprinting.

[0004]

[Problem(s) to be Solved by the Invention] However, there was a fault of causing the phenomenon in which the imprint layer which the slit part of the imprint foil 7 becomes from \*\*\*\*\* 3, i.e., stratum disjunctum, a pattern layer 4, the adhesives layer 5, etc. by the shock which the cutting edge in the case of a slit hits separates from a base film 1, in this case (refer to drawing 6 ). Between the base film of an imprint foil, and an imprint layer, this is because the part which is not is also excellent in detachability \*\*\*\* not only at the part with which decalcomania is presented but at decalcomania. When there was the need of preparing a vacuum evaporation layer as a pattern layer, stratum disjunctum could not but become thick like a rebound ace court foil, and there was much stratum functionale, the time as total of this fault when an imprint layer is thicker was [ be / when / there were many pattern layers as an imprint layer, or ] more remarkable.

[0005] Consequently, this piece 9 of \*\*\*\*\* adhered to the imprint foil, and entered between the transferred object and the imprint layer at the time of an imprint. Moreover, in the in mould imprint which arranges an imprint foil in metal mold and imprints to shaping and coincidence, when the piece 9

of \*\*\*\*\* adhering to the imprint foil tooth back other than said phenomenon shifted to metal mold, \*\*\*\*\* called a dent was attached to mold goods.

[0006] Therefore, this invention is to solve the above problems and aims at offering the imprint foil which does not \*\*\*\*\* in case a slit is carried out so that it may become the suitable width of face for an imprint.

[0007]

[Means for Solving the Problem] In order to attain the above object, the imprint foil which this invention does not \*\*\*\*\* constituted as the stratum disjunctum not exfoliating is extensively prepared in it from a base film and the laminating of a pattern layer and the adhesives layer is carried out to it one by one on stratum disjunctum, although it exfoliates in the near field in which easily-adhesive processing is performed to one side of a base film, the mold-release layer is prepared except for the slit part on the easily-adhesive processing side, and the mold-release layer of a base film was prepared from a mold-release layer.

[0008]

[Embodiment of the Invention] Hereafter, this invention is explained in more detail, referring to a drawing.

[0009] The typical partial expanded sectional view in which it is shown immediately after the typical partial expanded sectional view showing one example of the imprint foil which drawing 1 requires for this invention, and which does not \*\*\*\*\* , and drawing 2 carry out the slit of the imprint foil which drawing 1 does not \*\*\*\*\* , and drawing 3 are the typical partial expanded sectional views showing the exfoliation process when imprinting after a slit the imprint foil which drawing 1 does not \*\*\*\*\* . the inside of drawing, and 1 -- a base film and 1a -- in stratum disjunctum and 4, a pattern layer and 5 show a glue line and, as for an easily-adhesive processing side and 2, 6 shows [ a mold release layer and 3 ] a slit part, respectively.

[0010] As construction material of a base film 1, the complex of cellulose type sheets, such as metallic foils, such as resin sheets, such as a polypropylene resin, polyethylene system resin, polyamide system resin, polyester system resin, Pori acrylic resin, and polyvinyl chloride system resin, aluminium foil, and copper foil, glassine, coat paper, and cellophane, or each above sheet etc. can use what is used as a base film 1 of the usual imprint material. As for one side of such a base film 1, easily-adhesive processing is performed. In case easily-adhesive processing carries out the slit of the imprint foil 7 so that it may become the suitable width of face for an imprint, it is processing for making it stick so that stratum disjunctum 3 may not exfoliate from a base film 1. There are a corona treatment method which make it easy to damage base film 1 front face and to stick as an easily-adhesive art, for example, a method of giving an anchor coat on the front face at the time of base film 1 manufacture, etc.

[0011] When the mold release layer 2 exfoliates a base film 1 after an imprint or a shaping simultaneous imprint, it is a layer released from mold from stratum disjunctum 3 with a base film 1, and is prepared in easily-adhesive processing side 1a of a base film 1 except for the slit part 6 of the imprint foil 7. As construction material of the mold release layer 2, an epoxy resin system release agent, an epoxy melamine resin system release agent, a melamine resin system release agent, a silicone resin system release agent, a fluororesin system release agent, a cellulosic system release agent, a urea-resin system release agent, a polyolefin resin system release agent, paraffin series release agents, these compound-die release agents, etc. can be used. There are print processes, such as gravure and screen printing, as the formation approach of the mold release layer 2. The above-mentioned slit part 6 is a part with a width of face of about 5-10mm which met the line which plans the slit of the imprint foil 7. In addition, some things for which width of face of the slit part 6 is made large more are not cared about although it becomes in uneconomical. However, making narrower width of face of the slit part 6 has a problem from the relation of slit precision. That is, there is a danger that a slit cutting edge will shift rather than the slit part 6.

[0012] Stratum disjunctum 3 is extensively formed on the base film 1 with which the mold release layer 2 was formed. When stratum disjunctum 3 exfoliates a base film 1 after an imprint or a shaping simultaneous imprint, it is a layer which the part formed on the mold release layer 2 exfoliates from the

mold release layer 2, it becomes the outermost side of a transferred object, and the part 6 directly formed in easily-adhesive processing side 1a of a base film 1, i.e., a slit part, does not exfoliate from a base film 1, but sticks and remains in a base film 1 side. Therefore, since stratum disjunctum 3 has stuck to the base film 1 in the slit part 6, \*\*\*\*\* is not started, in case a slit is carried out so that it may become the suitable width of face for an imprint.

[0013] As construction material of stratum disjunctum 3, 1 thermoplasticity acrylic resin, 2 polyester acrylate, The prepolymer which has polymerization nature functional groups, such as polyether acrylate, urethane acrylate, epoxy acrylate, SUPIRO acetal acrylate, polybutadiene acrylate, and a styrene system prepolymer, Reactant diluents, such as a styrene system diluent, an acrylic monomer diluent, and an epoxy system diluent, The benzoin alkyl ether and the benzophenones which are added as occasion demands, Ultraviolet rays or electron ray hardenability resin which consists of photopolymerization initiators, such as acetophenones,

mold release layer 2, it becomes the outermost side of a transferred object, and the part 6 directly formed in easily-adhesive processing side 1a of a base film 1, i.e., a slit part, does not exfoliate from a base film 1, but sticks and remains in a base film 1 side. Therefore, since stratum disjunctum 3 has stuck to the base film 1 in the slit part 6, \*\*\*\*\* is not started, in case a slit is carried out so that it may become the suitable width of face for an imprint.

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[0014] As the formation approach of stratum disjunctum 3, there are print processes, such as the coat methods, such as the gravure coat method, the roll coat method, a comma coating method, and the lip coat method, gravure, and screen printing. Moreover, the stratum disjunctum 3 which consists of a component of 2 is a precure type, and, subsequently performs ultraviolet rays or electron beam irradiation after solvent desiccation. In addition, the stratum disjunctum 3 which consists of a component of 3 and 4 is an after-cure type, does not irradiate at the time of imprint foil production, but irradiates after an imprint or a shaping simultaneous imprint.

[0015] A pattern layer 4 is usually formed as a printing layer on stratum disjunctum 3. It is good to use the coloring ink which uses resin, such as polyvinyl system resin, polyamide system resin, polyester system resin, Pori acrylic resin, polyurethane system resin, polyvinyl-acetal system resin, polyester polyurethane system resin, cellulose ester system resin, and alkyd resin, as a binder, and contains the pigment or color of a suitable color as a coloring agent as construction material of a printing layer. It is good to use the usual print processes, such as offset printing, gravure, and screen printing, etc. as the formation approach of a printing layer. In order to perform multicolored printing and a gradation expression especially, offset printing and gravure are suitable. Moreover, in the case of monochrome, the coat methods, such as the gravure coat method, the roll coat method, a comma coating method, and the lip coat method, are also employable. A printing layer has the common case where it prepares selectively when preparing extensively according to a pattern to express.

[0016] Moreover, a pattern layer 4 may consist of combination of the thing which consists of a metal thin film layer or a printing layer, and a metal thin film layer. A metal thin film layer is for expressing metallic luster as a pattern layer 4, and is formed by vacuum deposition methods, such as a resistance heating method, the sputtering method, and the ion plating method, electroplating, etc. In this case, according to a metallic luster color to express, metals, such as aluminum, nickel, gold, platinum, chromium, iron, copper, tin, an indium, silver, titanium, lead, and zinc, these alloys, or a compound is used. After forming a solvent fusibility resin layer in the part which does not need a metal thin film layer as an example of the approach of forming a partial metal thin film layer, a metal thin film is extensively formed on it, and there is a method of performing solvent cleaning and removing an unnecessary metal thin film with a solvent fusibility resin layer. In this case, the solvent used well is water or a water solution. Moreover, there is a method of removing metal thin films other than the part which forms a metal thin film extensively, forms a resist layer in a part to leave the metal thin film next, etches with an

acid or alkali as another example, and is covered in the resist layer. In addition, in case a metal thin film layer is prepared, in order to raise the adhesion of the adjoining layer and metal thin film layer, a before support layer and an after support layer may be prepared. As construction material of a before support layer and an after support layer, it is good to use 2 acidity-or-alkalinity hardening urethane resin, heat-curing urethane resin, melamine system resin, cellulose ester system resin, chlorine content rubber system resin, chlorine content vinyl system resin, Pori acrylic resin, epoxy system resin, the vinyl system copolymer resin, etc. As the formation approach of a before support layer and an after support layer, there are print processes, such as the coat methods, such as the gravure coat method, the roll coat method, a comma coating method, and the lip coat method, gravure, and screen printing.

[0017] A glue line 5 pastes up above-mentioned each class on transferred object 8 front face. A glue line 5 is formed in a part to make it paste. That is, if a part to make it pasting is all-out, a glue line 5 is formed extensively. Moreover, if a part to make it pasting is partial, a glue line 5 is formed selectively. As a glue line 5, the thermosensitive and pressure-sensitive resin suitable for the raw material of the transferred object 8 is used suitably. For example, when the construction material of the transferred object 8 is Pori acrylic resin, it is good to use Pori acrylic resin. Moreover, what is necessary is just to use these resin, affinitive Pori acrylic resin, polystyrene system resin, polyamide system resin, etc., when the construction material of a transferred object is polyphenylene oxide polystyrene system resin, polycarbonate system resin, styrene copolymer system resin, and polystyrene system blend resin. Furthermore, when the construction material of a transferred object is polypropylene resin, chlorination polyolefin resin, chlorination ethylene-vinylacetate copolymer resin, cyclized rubber, and cumarone indene resin are usable. As the formation approach of a glue line 5, there are print processes, such as the coat methods, such as the gravure coat method, the roll coat method, a comma coating method, and the lip coat method, gravure, and screen printing.

[0018] in addition, the voice which described above the configuration of the imprint foil which does not \*\*\*\*\* -- it is not limited like, and when using what was excellent in the adhesive property with a transferred object as construction material of a pattern layer 4, a glue line 5 can be omitted.

[0019]

[Example]

The biaxial drawing polyethylene terephthalate film (Toray Industries, Inc. make F-39) with a thickness of 38 micrometers which performed easily-adhesive processing to example 1 one side beforehand was used as a base film. After carrying out gravure of the epoxy melamine resin to the easily-adhesive processing side of a base film except for a slit part with a width of face of 10mm using the ink used as a principal component, the mold release layer with a thickness of about 1 micrometer was prepared by heating for 20 seconds at 170 degrees C. Although it exfoliated from the mold release layer by carrying out gravure of the thermoplastic acrylic resin (Mitsubishi rayon company make BR-83 (MMA)) extensively using the ink used as a principal component on the base film with which the mold release layer was prepared, from the base film, the stratum disjunctum with a thickness of 1 micrometer not exfoliating was prepared. By carrying out gravure of the pattern pattern using the ink which uses vinyl acrylic copolymerization resin and a coloring agent as a principal component on stratum disjunctum, each pattern layer was prepared and sum total thickness of all pattern layers was set to 5 micrometers. By carrying out gravure of the acrylic resin extensively using the ink used as a principal component on stratum disjunctum and a pattern layer, the glue line with a thickness of 2 micrometers was prepared and the imprint foil which does not \*\*\*\*\* was obtained.

[0020] The biaxial drawing polyethylene terephthalate film (Toyobo make E-4100) with a thickness of 38 micrometers which performed easily-adhesive processing to example 2 one side beforehand was used as a base film. After carrying out gravure of the amino alkyd resin to the easily-adhesive processing side of a base film except for a slit part with a width of face of 10mm using the ink used as a principal component, the mold release layer with a thickness of about 1 micrometer was prepared by heating for 30 seconds at 150 degrees C. After carrying out the gravure coat of the ultraviolet-rays hardenability resin which consists of the three following kinds of constituents on the base film with which the mold release layer was prepared extensively using the ink used as a principal component and heating it for 10



seconds at 80 degrees C, although it exfoliated from the mold release layer by carrying out about 500 mj/cm<sup>2</sup> UV irradiation, from the base film, the stratum disjunctum with a thickness of 5 micrometers not exfoliating was prepared.

Prepolymer which has a polymerization nature functional group Urethane acrylate The 80 sections Reactant diluent Trimethyl propane acrylate The 20 sections Photopolymerization initiator Benzophenone The three sections [0021] By carrying out gravure of the pattern pattern using the ink which uses acrylic resin and a coloring agent as a principal component on stratum disjunctum, each pattern layer was prepared and sum total thickness of all pattern layers was set to 3 micrometers. By carrying out gravure of the acrylic resin extensively using the ink used as a principal component on stratum disjunctum and a pattern layer, the glue line with a thickness of 2 micrometers was prepared and the imprint foil which does not \*\*\*\*\* was obtained.

[0022] The biaxial drawing polyethylene terephthalate film ( made from diamond HOIRUHEKISUTO G-120E) with a thickness of 38 micrometers which performed easily-adhesive processing to example 3 one side beforehand was used as a base film. After carrying out gravure of the epoxy melamine resin to the easily-adhesive processing side of a base film except for a slit part with a width of face of 10mm using the ink used as a principal component, the mold release layer with a thickness of about 1 micrometer was prepared by heating for 20 seconds at 170 degrees C. The gravure coat was extensively carried out using the ink which uses as a principal component the ultraviolet-rays hardenability resin which consists of the four following kinds of constituents on the base film with which the mold release layer was prepared, and although it exfoliated from the mold release layer by heating for 30 seconds at 150 degrees C, from the base film, the stratum disjunctum with a thickness of 5 micrometers not exfoliating was prepared.

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Solvent MEK The 160 sections Photopolymerization initiator 2-hydroxy 2 methyl 1 phenyl propane 1 ON The five sections [0026] By carrying out gravure of the pattern pattern using the ink which uses acrylic resin and a coloring agent as a principal component on stratum disjunctum, each pattern layer was prepared and sum total thickness of all pattern layers was set to 3 micrometers. By carrying out gravure of the acrylic resin extensively using the ink used as a principal component on stratum disjunctum and a pattern layer, the glue line with a thickness of 2 micrometers was prepared and the imprint foil which does not \*\*\*\*\* was obtained.

[0027] Next, when the slit was carried out in the part in which the mold release layer is not prepared about each imprint foil obtained in the above-mentioned examples 1-4, \*\*\*\*\* was not generated at all.

[0028]

[Effect of the Invention] Since the imprint foil which this invention does not \*\*\*\*\* has a configuration as above, it has the following outstanding effectiveness.

[0029] That is, although it exfoliates from a mold release layer, since the stratum disjunctum not exfoliating is extensively prepared in the near field in which easily-adhesive processing is performed to one side of a base film, the mold release layer is prepared except for the slit part on the easily-adhesive processing side, and the mold release layer of a base film was prepared from the base film, \*\*\*\*\* is not started, in case a slit is carried out so that it may become the suitable width of face for an imprint.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the typical partial expanded sectional view showing one example of the imprint foil concerning this invention which does not \*\*\*\*\*.

[Drawing 2] It is the typical partial expanded sectional view in which it is shown immediately after carrying out the slit of the imprint foil which drawing 1 does not \*\*\*\*\*.

[Drawing 3] It is the typical partial expanded sectional view showing the exfoliation process when imprinting after a slit the imprint foil which drawing 1 does not \*\*\*\*\*.

[Drawing 4] It is the typical partial expanded sectional view showing one example of the conventional imprint foil.

[Drawing 5] It is drawing explaining the slit of an imprint foil.

[Drawing 6] It is the typical partial expanded sectional view in which it is shown immediately after carrying out the slit of the imprint foil of drawing 4.

[Description of Notations]

1 Base Film

1a Easily-adhesive processing side

2 Mold Release Layer

3 Stratum Disjunctum

4 Pattern Layer

5 Glue Line

6 Slit Part

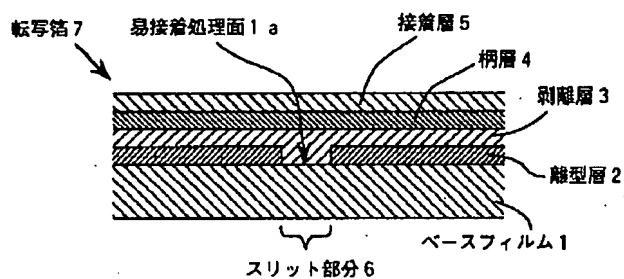
7 Imprint Foil

8 Transferred Object

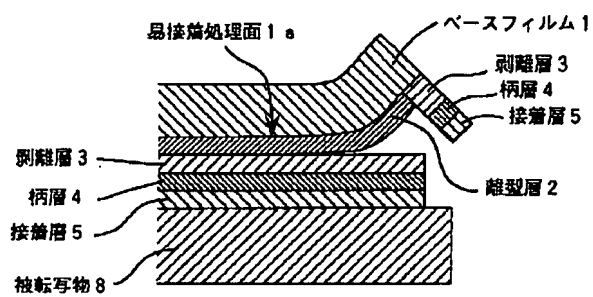
9 Piece of \*\*\*\*\*

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[Translation done.]

Drawing selection  

[Translation done.]

Drawing selection  

[Translation done.]